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STUDENT LESSON
AN/PRS-7 MINE DETECTOR

MOS 12B
COMBAT ENGINEER
SKILL LEVEL I

PREPARED BY
UNITED STATES ARMY ENGINEER SCHOOL
FORT BELVOIR, VIRGINIA 22060

FOR
U.S. ARMY RESERVE SCHOOLS

U.S. ARMY TRAINING SUPPORT CENTER
RESERVE SCHOOLS DIVISION
FORT EUSTIS, VA. 23604

D 103.2:

TASK #051-192-1024 Locate Mines Using the AN/PRS-7 Mine Detector Set

TRAINING OBJECTIVES

TASK: Locate metal, using an AN/PRS-7 mine detector.

CONDITIONS: Given an AN/PRS-7 mine detector correctly packed in it's case, a straight tip screwdriver, during daylight, in an outside area with recorded locations of buried metal.

STANDARDS: Unpack, inspect, assemble, tune, operate, disassemble and repack an AN/PRS-7 mine detector without error. Locate all buried metal in a designated area during operation.

RESOURCES REQUIRED

The following references were used to prepare this lesson. These items should be reviewed by each manager prior to scheduled training. This material is to be available at the training site as student study resources. These references may be studied by the student anytime, except during testing.

FM 20-32	Land Mine Warfare
TM 9-1345-203-12&P	Land Mines
GTA 5-10-27	Mine Card

PRETEST OPTION

You have a choice to either take a pretest or take the lesson. The lesson will assist you in learning the training objective. The pretest will test your knowledge and skills on the training objective.

DECIDE NOW!!!

If you have decided to take the pretest, notify the manager NOW.

If you have decided to take the lesson, continue reading.

INTRODUCTION

Welcome to the lesson on the AN/PRS-7 mine detector. This lesson explains how to safely and correctly place into operation and recover the AN/PRS-7 mine detector. The AN/PRS-7 mine detector is designed to detect the presence of mines, either metallic or nonmetallic. Learning the correct procedures for operating this mine detector will assist you in performing your MOS, give you more confidence in your ability to master tasks that are new to you and make you much more valuable to your unit. This is a self study, self-paced lesson. Even so, if you have questions, your lesson manager will clarify the lesson material.

Look at Figure 1 and become familiar with the parts of the AN/PRS-7 mine detector. Learn the names of the parts and locate them on the mine detector you have been issued.

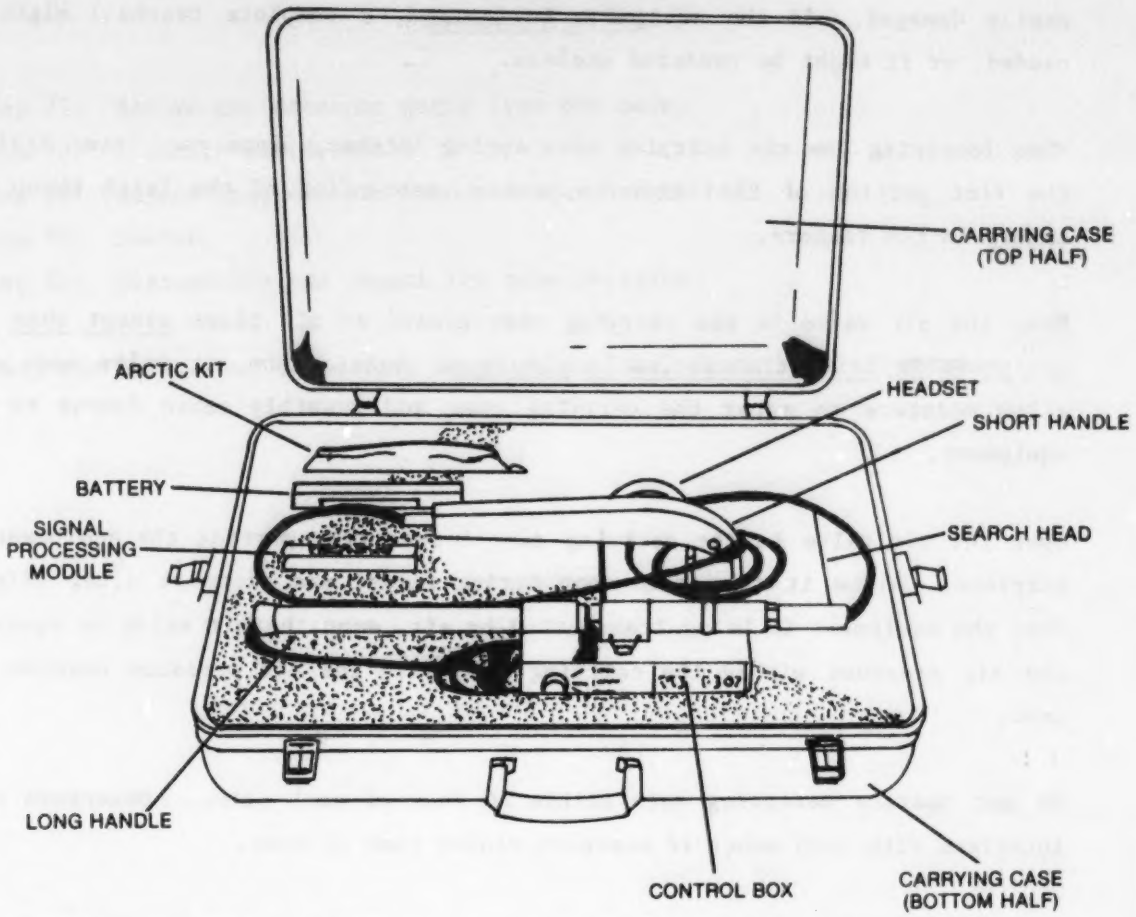


Figure 1 - Mine Detecting Set An/Prs-7 (Portable)

SAFETY PRECAUTIONS

The operating procedures and practices stated in this lesson must be observed; otherwise, injury to the operator, damage to the equipment or faulty operation of the equipment may result.

Use extreme care in unpacking, handling and repacking the equipment; it is easily damaged. If the equipment is damaged, a complete overhaul might be needed, or it might be rendered useless.

When loosening the six carrying case spring latches, place your thumb against the flat portion of the latch to prevent rebounding of the latch throw and injury to the fingers.

Keep the air valve in the carrying case closed at all times except when the equipment is being transported by airplane. Leaving the air valve open will allow moisture to enter the carrying case and possibly cause damage to the equipment.

Open the air valve in the carrying case before transporting the equipment by airplane. Allow it to remain open during flight and close it after flight. When the equipment is being transported by air, open the air valve to equalize the air pressure within the carrying case with the air pressure outside the case.

Do not operate detecting sets within 20 feet of each other. Detectors will interfere with each other if operated closer than 20 feet.

To outline a mine, make sure the selector switch is in the "POINT" position.

Never use steel wool in cleaning terminals or any unpainted surfaces. Even small particles of steel wool in the equipment could cause internal shorting or grounding of cirucits.

Remember these precautions as you work this lesson and as you use the mine detector.

READEX FICHE best copy available

LESSON

The steps below are listed in the suggested sequence for complete and correct use of the AN/PRS-7 mine detector. These steps are fully explained in this lesson in the same sequence as listed. Study the explanations before doing these steps.

PROCEDURE STEPS

Step #1: Remove the detector parts from the case.

Step #2: Assemble the detector.

Step #3: Adjust controls and tune the mine detector.

Step #4: Search.

Step #5: Disassemble and repack the mine detector.

Learn the details of these five steps as you work through this lesson.

STEP 1 - REMOVE THE DETECTOR PARTS FROM THE CASE

1. Open the pressure relief valve (see Figure 2) located on the front of the carrying case opposite the handle and then open the carrying case by loosening the six latches and lifting off the top section.

WARNING: WHEN LOOSENING THE SIX SPRING-LOADED LATCHES, PLACE THE THUMB AGAINST THE FLAT PORTION OF THE LATCH TO PREVENT REBOUNDING OF THE LATCH THROW AND INJURY TO THE FINGERS.

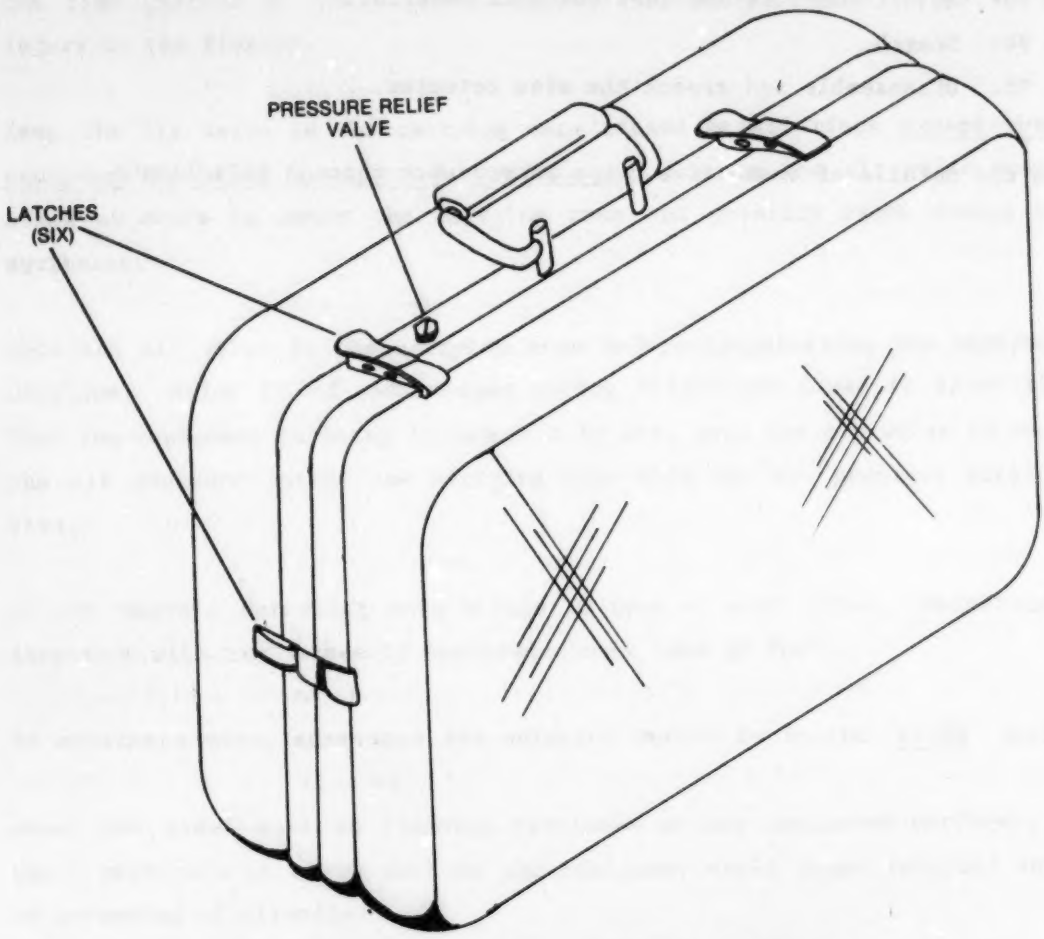


Figure 2 - Detector Set, Mine-Portable AN/PRS-7

2. Remove the search head assembly with short handle attached, the long handle assembly with control-box attached and one battery. (See Figure 3).

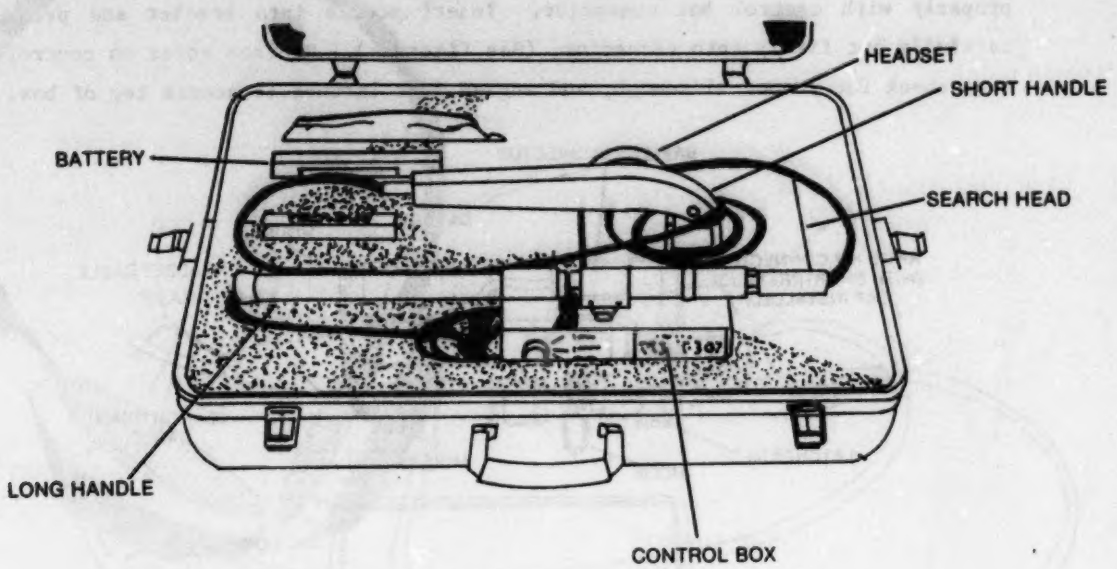


Figure 3 - Parts of Mine Detecting Set AN/PRS-7 (Portable)

Go to step 2

STEP 2 - ASSEMBLE THE DETECTOR

1. Unfasten the four latches which secure the top on the control box and insert the battery, terminal end, toward the search head. Note arrangement of pins on plug and insert into battery accordingly. Position module to align properly with control box connector. Insert module into bracket and press carefully but firmly into connector, (See Figure 4). Replace cover on control box; check for proper alignment, and engage four latches to secure top of box.

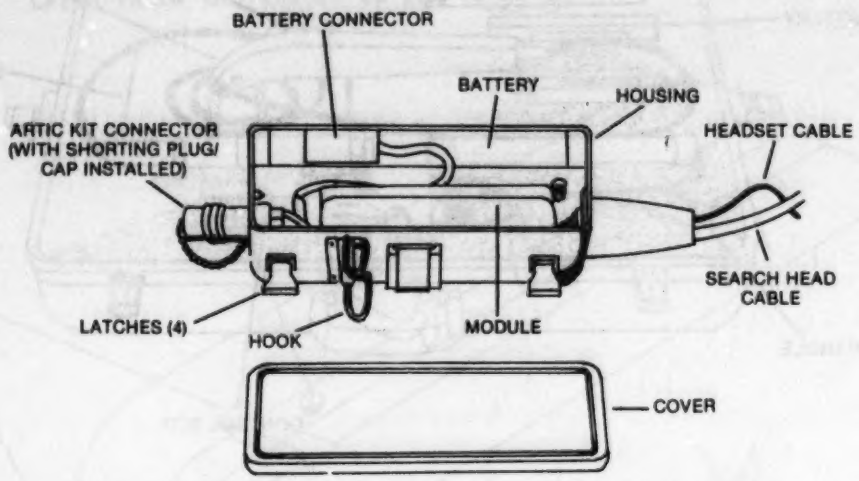


Figure 4 - Control Box Assembly, Top View, Cover Removed

2. Attach the long handle to the short handle by means of the quick-disconnect coupling. Engage and compress spring loaded coupling and twist 1/4 turn clockwise. (See Figure 5).

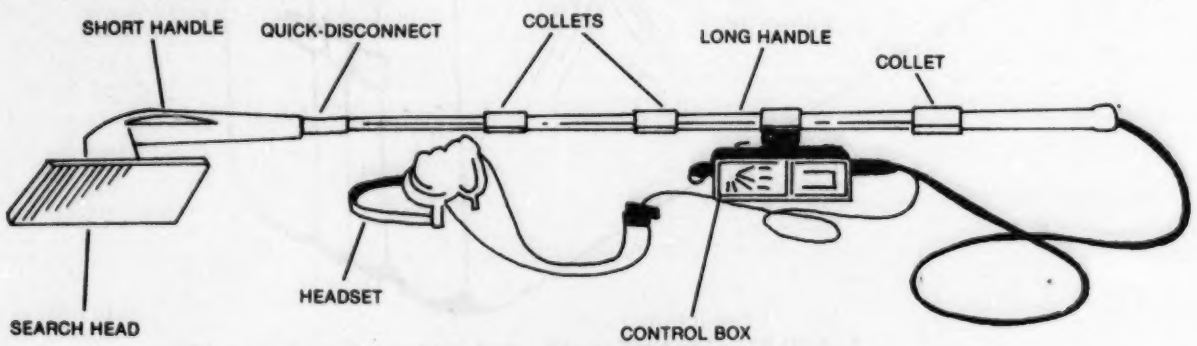


Figure 5 - Detecting Set (Assembled)

3. Put on the headset with the headband forward. Adjust headband so that the rubber ear cushions press against the ears with just enough pressure to create a partial seal against outside noises. Fasten the spring clip on the headset cable to the clothing, allowing enough slack between headset and clip so that the head can be turned without adding pressure to the ear cushions.

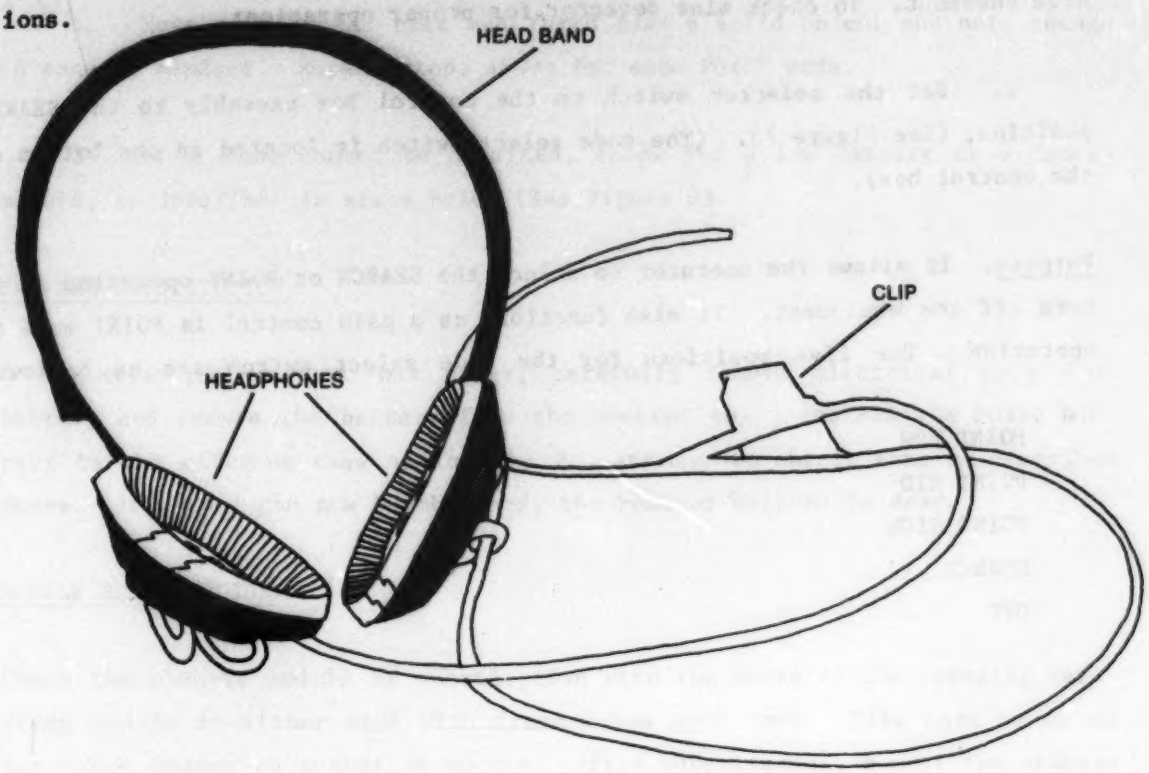


Figure 6 - Headset Assembly

4. Short Handle Adjustment. To adjust the handle to a desired angle on the search head assembly proceed as follows:

a. Extend the long handle assembly by loosening collets, adjusting sections to comfortable length and tightening collets, (Figure 5).

b. With the search head assembly resting on the ground, loosen the slotted nut on the bolt that connects the short handle to the search head, and move the short handle to the angle desired.

c. Tighten the slotted nut to secure the handle in position.

STEP #3 - ADJUST CONTROLS AND TUNE THE MINE DETECTOR

Mode checkout. To check mine detector for proper operation:

1. Set the selector switch on the control box assembly to the SEARCH position, (See Figure 7). (The mode select switch is located on the bottom of the control box).

Purpose. It allows the operator to select the SEARCH or POINT operation or to turn off the equipment. It also functions as a gain control in POINT mode of operation. The five positions for the mode select switch are as follows:

POINT LOW
POINT MID
POINT HIGH
SEARCH
OFF

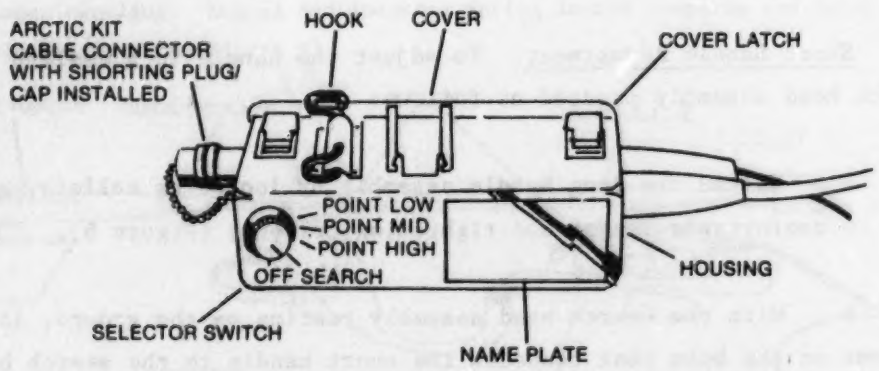


Figure 7 - Control Box Assembly

2. Hold the detecting set so that the search head assembly is approximately 5 feet above the ground and away from solid objects.

3. Listen for a tone in the headset.

4. Move search head back and forth over a solid object and note change in tone in headset. Repeat steps above for each POINT mode.

5. If a tone cannot be obtained, check for a low battery or a faulty module, as described in steps below (See Figure 8).

BATTERY SUBSTITUTION.

Remove the control box cover, carefully remove electrical plug from battery and remove the battery from the control box. Install the spare battery in the carrying case as in Step 2. Attempt to obtain tone as described above. If a tone can now be obtained, the removed battery is dead.

MODULE SUBSTITUTION.

Check the plug-in module by substitution with the spare in the carrying case. Grasp module on either side with fingers and work free. Take care so as to not cause damage to socket or module. After substitution, repeat the process for obtaining a tone. If a tone is heard after module replacement, the removed module is defective.

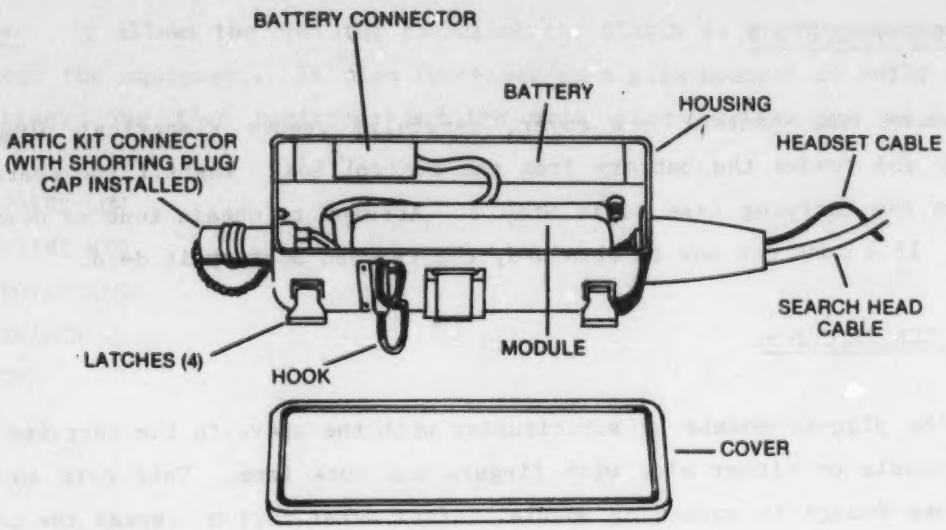
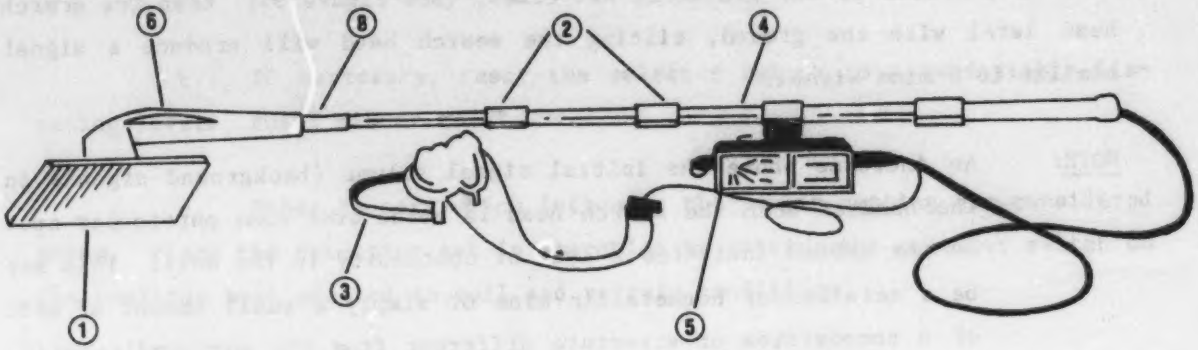


Figure 8 - Control Box Assembly, Top View, Cover Removed

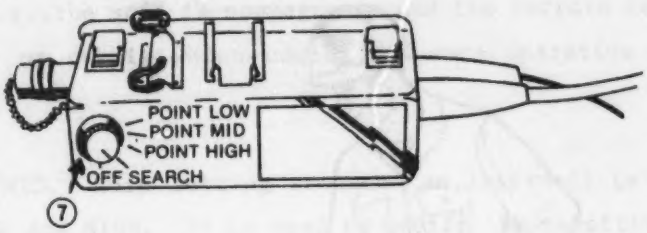
Now work Exercise #1 on the next page.

EXERCISE NUMBER 1.

Identify the parts indicated by numbered arrows in the diagram below. Write your answers on scratch paper. Choose your answer from the list below.



A. Short handle
B. Headset
C. Quick Disconnect
D. Search Head
E. Collets
F. Control Box
G. Long Handle
H. Selector Switch



Correct identifications are located on Figures 5 and 7. If you answered all questions correctly go to Step 4. If you missed more than one question, restudy the parts of the mine detector before going to Step 4.

STEP #4 - SEARCH.

1. Hold the search head approximately 1 1/2 inches above the ground, depending upon the surface condition of the ground and the type of soil, and sweep it slowly from side to side at an approximate sweep rate of 5 feet in 1 1/2 to 3 seconds (2 to 3 feet per second). With each sweep, advance a distance just less than the width of the search head. Ensure that the search head is parallel to the ground at all times, (See Figure 9). Keep the search head level with the ground, tilting the search head will produce a signal similar to a mine signal.

NOTE: An increase above the initial signal volume (background signal) in the headset when the search head is moved over some particular spot on the ground indicates a lack of continuity in the soil. This may be a metallic or nonmetallic mine or simply a small amount of soil of a composition or structure different from the surrounding soil. A buried mine will give a sharper, more pronounced signal than that resulting from a difference in soil conditions.

Figure 9 - Detecting Set Operation in Standing Position

2. Maintain a minimum distance of 20 feet between operators when more than one detecting set is being operated in the same area. This will prevent signals from other detecting sets interfering with signals from mines. If the presence of a buried object is indicated, proceed as outlined below.

3. Locating Exact Position of Buried Mine.

a. Turn the selector switch from SEARCH to POINT HIGH position.

b. If necessary, reset the selector switch to a comfortable listening level: POINT MID or POINT LOW.

c. Other factors which influence the proper setting are considered below. Place the detecting set in operation by setting the selector switch to the position best adapted to soil and terrain conditions.

(1) POINT HIGH. In this position, the selector switch produces maximum sensitivity in the detecting set. It is effectively used when interferance is minimal, i.e.,the soil is nonmagnetic and the terrain is clear of surface metallic scrap or debris which could influence operation of the equipment.

(2) POINT MID. This setting produces an intermediate sensitivity, between that of LOW and HIGH. It is used to modify the sensitivity so as to shut out interference from surface metallic objects.

(3) POINT LOW. This setting is useful for operation over terrain that is covered with metallic debris and scrap, where a high exclusion factor is desired in the equipment's responses. Responses to small metallic objects will be eliminated but large objects such as metallic mines will yield an adequate signal.

WARNING

WHEN THE EQUIPMENT IS BEING OPERATED WITH THE SELECTOR SWITCH IN THE MID OR LOW POINT POSITIONS, THE OPERATOR SHOULD BE EXTREMELY ALERT FOR MINE INDICATING SIGNALS SINCE THESE LOWER LEVEL SENSITIVITIES DO NOT DISCLOSE THE PRESENCE OF A MINE AS QUICKLY AS THE HIGH POINT LEVEL DOES. SELECTION OF A PROPER SWITCH SETTING FOR ANY OF THE VARIOUS CONDITIONS WHICH MAY BE ENCOUNTERED DEPENDS LARGELY UPON THE JUDGMENT OF THE OPERATOR, BASED UPON HIS EXPERIENCE WITH THE EQUIPMENT. USE POINT SETTINGS FOR OUTLINING MINES ONLY. DO NOT SEARCH FOR MINES IN ANY MODE OTHER THAN "SEARCH".

d. The correct sensitivity range having been determined and the switch set accordingly, proceed as follows: Hold the detecting set as illustrated in Figures 10/11 and sweep the search head slowly from side to side over the area. A sharp increase in signal volume will be heard from the headset as each side of the search head passes over the edge of the buried object. The signal volume will decrease when the search head is directly over the object. The outline of the buried object can be accurately determined by this procedure.

WARNING

TO OUTLINE A MINE, MAKE SURE THE SELECTOR SWITCH IS IN THE POINT POSITION. DO NOT USE SEARCH FOR OUTLINING A MINE.

4. Stopping. To shut down the equipment, turn the selector switch to the OFF position. Always turn the selector switch to the OFF position when the detecting set is not in use.

After looking at Figure 10 and 11 - continue with Step 5.

Figure 10 - Detector Set Operation in Standing Position

Figure 11 - Detector Set Operation in Prone Position.

STEP # 5 - DISASSEMBLE AND REPACK THE MINE DETECTOR.

Disassembly and Repacking

A step by step procedure for restoring the equipment to the carrying case follows:

1. Collapse the long handle assembly by loosening collets, adjusting sections to shortest length and tightening collets.

2. Detachment. To detach the long handle, grasp the short handle and twist spring loaded collet on long handle 1/4 turn, counterclockwise. This disengages the coupling and permits the long handle to slide back free on the cable for storage in carrying case (See Figure 12).

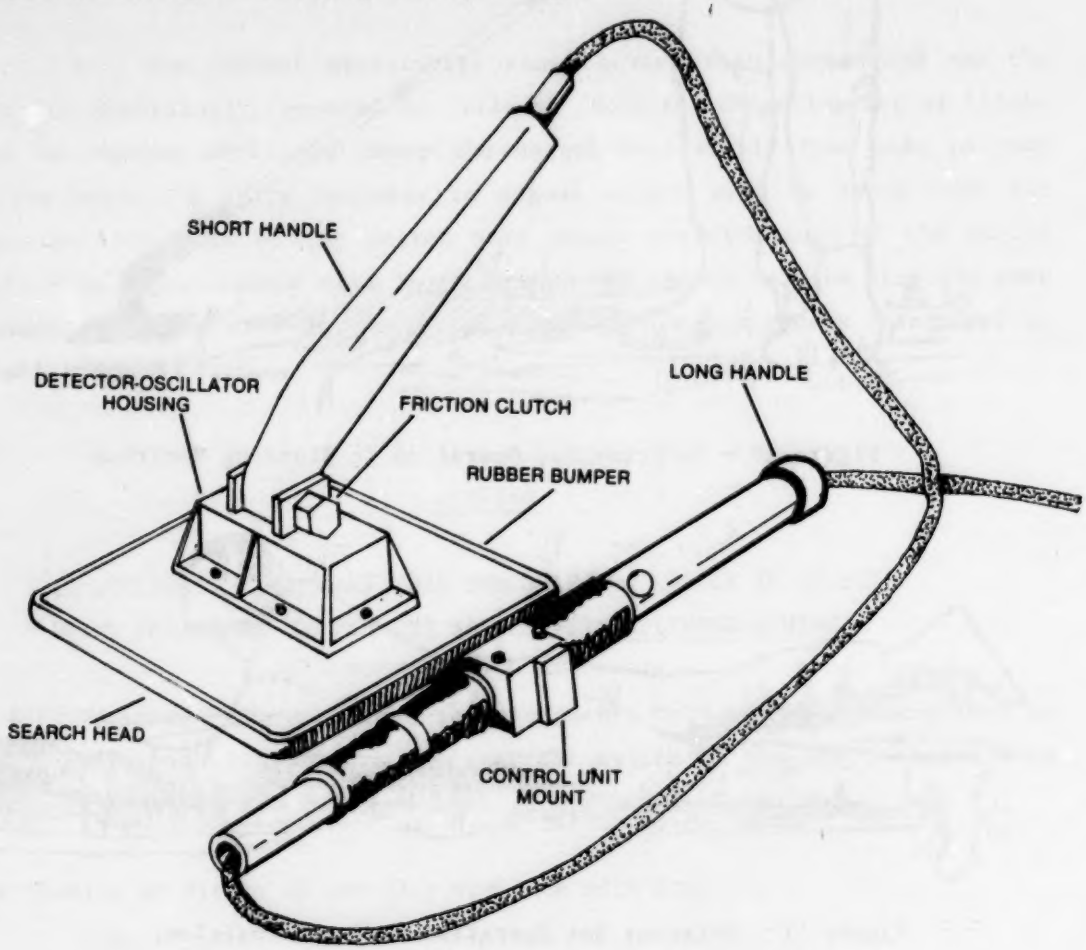


Figure 12 - Search Head Assembly (with handle)

3. Unfasten the four latches which secure the top on the control box and remove the control box cover, carefully remove electrical plug from battery and remove the battery from the control box. Grasp module on either side with fingers and work free. Take care so as to not cause damage to socket or module. Replace cover on control box, and engage four latches to secure top of box. (See Figure 13).

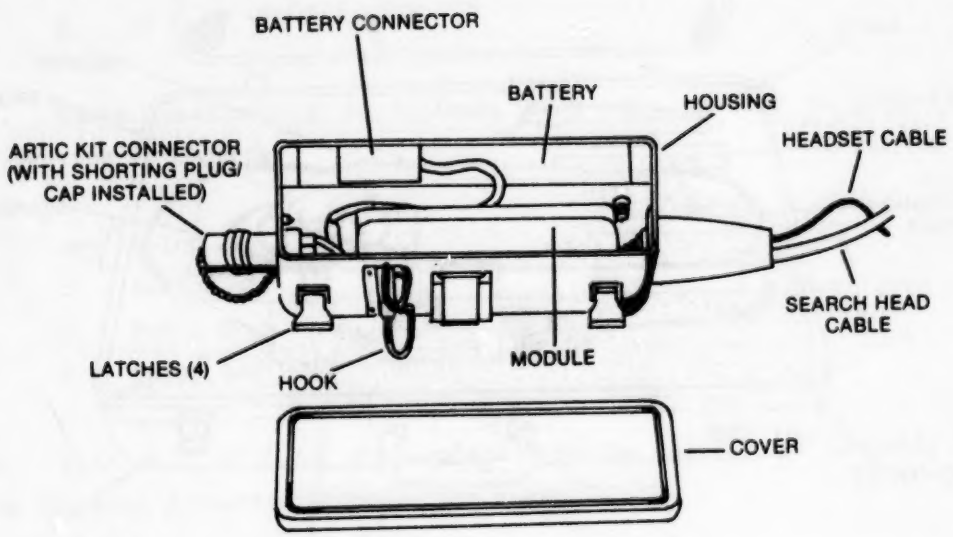


Figure 13 - Control Box Assembly, Top View, Cover Removed

4. Place each item into the compartment alloted to it in the carrying case (Figure 14).

5. Close the carrying case. The top section should fit on evenly and snugly without forcing; if it does not, check for proper placement of the contents, fouled cables, etc.

6. Secure the six latches.

7. Close the air pressure relief valve.

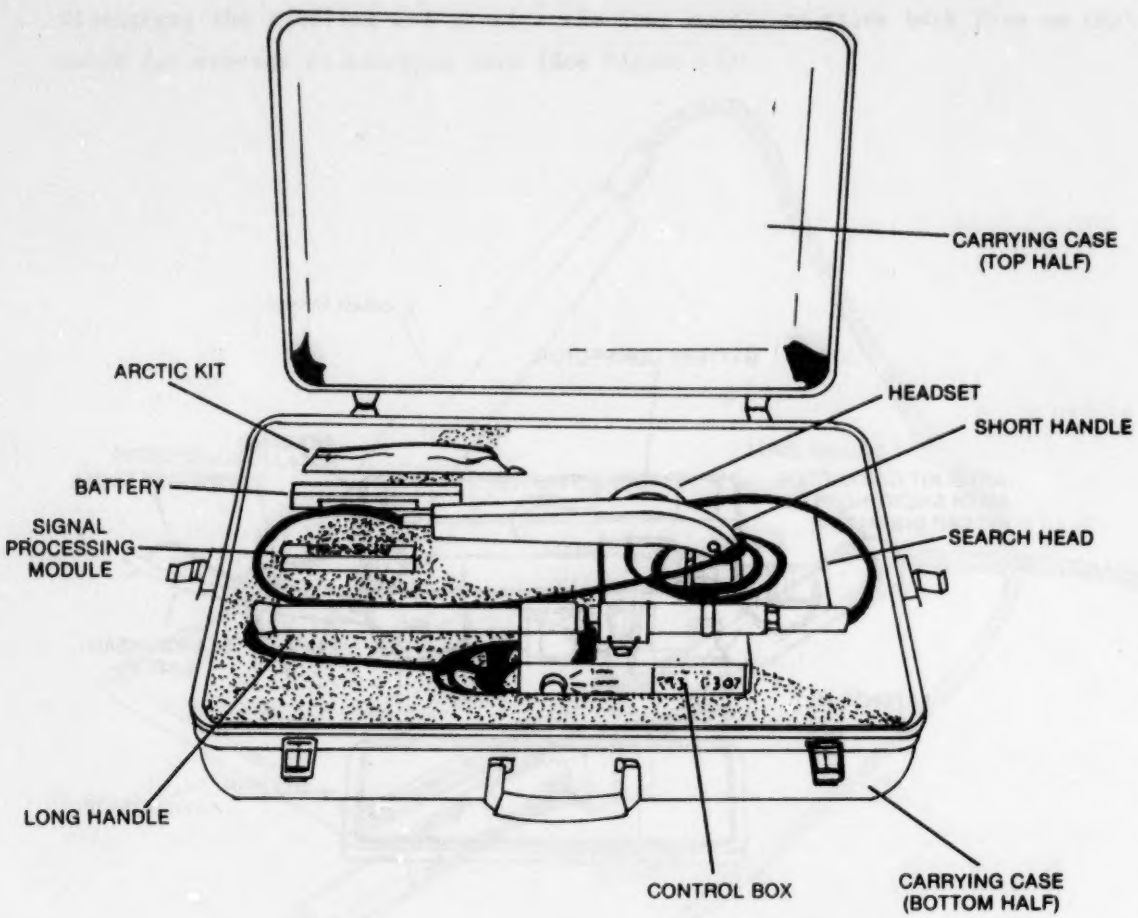


Figure 14 - Mine Detecting Set AN/PRS-7 (Portable)

EXERCISE NUMBER 2.

Select your answers from the multiple choice selections provided and write your selection on scratch paper.

When working with an AN/PRS-7 mine detector:

1. The search head is held about how many inches above the ground?

   a. 1.
   b. 1 1/2.
   c. 2.
   d. 2 1/2.

2. What distance must be maintained between mine detectors?

   a. 5 feet.
   b. 20 feet.
   c. 30 feet.
   d. 35 feet.

3. Where interference is minimum, what mode is used to pinpoint the exact location of objects?

   a. Point Mid.
   b. Search.
   c. Point High.
   d. Point Low.

4. What item or items are removed from the control box assembly before storing the mine detector? (Choose one answer).

   a. Battery.
   b. Module.
   c. Both battery and module.
   d. Batter, module and headset.

Answer Locations.

#1 Step 4, Paragraph 1.
#2 Step 4, Paragraph 2.
#3 Step 4, Paragraph 3, c, (1).
#4 Step 5, Paragraph 5.

Practice these procedures until you can do them without looking at the lesson, then ask the manager for the test.

Learning to use the AN/PRS-7 mine detector will greatly assist you in your job to locate and neutralize enemy mines. To remain proficient in the use of the AN/PRS-7, you must periodically practice with this detector. You cannot expect to remain proficient, unless you practice.

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